

Accidents That Shouldn't Happen

A Report of the Grade Crossing Safety Task Force to Secretary Federico Pena

**March 1, 1996
U.S. Department of Transportation**

Executive Summary

The principal finding of this report by the U.S. Department of Transportation Grade Crossing Safety Task Force (Action Plan) (Task Force) is consistent with, and fully supports, that of the Rail-Highway Crossing Safety Action Plan announced by Secretary of Transportation Federico Pena in 1994-that is, improved highway-rail grade crossing safety depends upon better cooperation, communication, and education among responsible parties if accidents and fatalities are to be reduced significantly.

This report explains how a lack of information and/or guidelines in the design, construction, operation, maintenance, and inspection of grade crossings led the Task Force to identify five safety problem areas for detailed examination-interconnected Signals; Vehicle Storage Space; High-Profile Crossings; Light Rail Transit Crossings; and Special Vehicle Operations. The five problem areas are described in the context of current practices using information drawn from technical studies, public outreach, and professional sources. As in the Action Plan, the crosscutting issues of funding, enforcement, coordination, information, standards, and education permeate the discussion.

The report recommends 24 specific follow-on actions to address both physical and procedural deficiencies. In practice, the responsibility for public grade crossings resides with State and local governments, railroads, and transit agencies. Recognizing the constrained budgets that are available to the private sector and State and local authorities, the report emphasizes rethinking existing practices-not requiring new ones from a regulatory approach. This reliance on existing opportunities is emphasized by recommendations that encourage grade crossing safety through coordinated inspections, law enforcement, and driver education.

To implement these recommendations, the Task Force has identified immediate steps that the Department will take to work with our constituents in defining a cooperative strategy for improving grade crossing safety. At the Federal level, the U.S. Department of Transportation will continue to work with organizations such as the American Association of State Highway and Transportation Officials, the Association of American Railroads, and the Institute of Transportation Engineers to develop standards and guidelines for best practices that identify highway-rail crossing problems and endorse a coordinated approach to their resolution. In the Action Plan, Secretary Pena set forth a goal of reducing crossing accidents and fatalities by 50% within 10 years. The Task Force believes that implementing the recommendations set forth in this report will help the Nation meet that goal.

GRADE CROSSING SAFETY TASK FORCE FINAL REPORT

WHY A TASK FORCE

At 7:10 a.m. on October 25, 1995, a school bus transporting 35 high school students stopped at a highway-rail crossing in Fox River Grove, Illinois, and was struck by a commuter train. Seven students died in this tragedy.

Following this accident and the questions that arose from it, Secretary of Transportation Federico Pena ordered the United States Department of Transportation (U.S. DOT) to build upon its 1994 Rail-Highway Crossing Safety Action Plan by forming an internal U.S. DOT Task Force to review the decision making process for designing, constructing, and operating rail crossings. The Secretary asked Associate Deputy Transportation Secretary Michael P. Huerta to head the Task Force. Task Force members included representatives from the Federal Railroad Administration (FRA), the Federal Highway Administration (FHWA), the National Highway Traffic Safety Administration (NHTSA), and the Federal Transit Administration (FTA).

The Secretary directed the Task Force to report back to him by March 1, 1996, with its evaluation of the decision making process related to the Nation's grade crossings, as well as recommendations for improvement. In preparing the report, the Secretary asked Mr. Huerta and the Task Force to consult with State and local transportation authorities, and the National Transportation Safety Board (NTSB) to identify how grade crossing safety could be improved. An NTSB representative later joined the Task Force and participated in its activities.

By the end of the second week following the Fox River Grove accident, the U.S. DOT Task Force had met to identify the problem areas that would be addressed in the report. The Task Force decided that their areas of focus would be those in which gaps in knowledge existed, but which were not addressed in the Action Plan. These five problem areas (with abbreviated titles in parentheses) were:

- 1.) Interconnected Highway Traffic Signal and Highway-Rail Crossing Warning Devices (Interconnected Signals)
- 2.) Available Storage Space for Motor Vehicles Between Highway-Rail Crossings and Adjacent Highway-Highway Intersections (Storage Space)
- 3.) High-Profile Crossings and Low-Clearance Vehicles (High-Profile Crossings)
- 4.) Light Rail Transit Crossings (Light Rail)
- 5.) Special Vehicle Operating Permits and Information (Special Vehicles)

WHAT HAS U.S. DOT BEEN DOING

Improved Crossing Safety As a National Goal

In 1972, Transportation Secretary John A. Volpe declared a goal of reducing rail crossing fatalities and accidents by 30% within 10 years. The initiative was successful. In 1972, over 1,500 fatalities and 12,000 accidents occurred. Ten years later, crossing collision statistics had declined to slightly more than 500 fatalities annually and approximately 1,000 accidents. This safety level has been sustained despite the greater accident exposure associated with significant increases in railroad and highway traffic between 1984 and 1994. Railroad activity increased 10% between

1993 and 1994 alone. In 1994, 615 individuals were killed and 1,961 were injured in 4,979 collisions with trains at highway-rail crossings in the United States.

The Section 130 Program

Meeting Secretary Volpe's goal was clearly attributable to the support and endorsement of Congress in the establishment of the Rail-Highway Crossings Program in the Highway Safety Act of 1913. This program, which became known as the Section 130 Program (from its citation in Title 23 of the United States Code), continues to be funded and supported by Congress, the States, and industry to this day. The program provides Federal funds for State efforts to reduce the incidence of accidents, injuries, and fatalities at public railroad crossings.

The States use Section 130 funds to install or improve signs and pavement markings, flashing light signals, automatic gates, crossing surfaces, and crossing illumination, and to close crossings. The Section 130 Program, which is administered by the FHWA, accounts for most of the funds for rail crossing improvements. Between 1974 and 1995, the States obligated over \$3 Billion in grade crossing safety funds for nearly 30,000 projects. The FHWA estimated that since its inception, the Section 130 Program has helped save almost 9,000 lives and prevent nearly 40,000 injuries. When considering crossing improvement options, the ultimate solution to train collisions is to eliminate ground-level crossings by a grade separation (bridge) or by consolidating and closing crossings. The U.S. DOT has worked with the State and local governments, the railroad industry, and national transportation associations to support this initiative, and several States have responded with legislative action.

In 1991, Congress enacted the Intermodal Surface Transportation Efficiency Act (ISTEA). In Section 1007 of ISTEA, Congress directed that States must set aside 10% of their Surface Transportation Program (STP) funds for safety improvements. In Fiscal Year 1996, the safety set-aside totals \$456 Million. Approximately \$152 Million of this amount must be reserved for carrying out the purposes of the Section 130 Program. In addition, \$143 Million of this set-aside fund is also eligible to eliminate crossing hazards should a State choose to use these funds for this purpose. Funds from the various other Federal-aid apportionment categories may also be used to improve crossing safety.

Grade Crossing Standards

Guidance to the highway community is provided by the American Association of State Highway and Transportation Officials (AASHTO) through its publication entitled A Policy on Geometric Design of Highways and Streets. This provides guidance in highway design in the form of recommended thresholds for critical dimensions. Further guidance is provided by FHWA in the Manual on Uniform Traffic Control Devices (MUTCD). The MUTCD provides national standards for traffic control devices at highway-rail crossings. The FHWA also publishes the Railroad-Highway Grade Crossing Handbook, which offers general guidance for making physical and operational improvements to grade crossings.

While this guidance exists, States and localities have flexibility to develop independent designs for each grade crossing.

In practice, the construction and maintenance of highways, and the laws regulating the vehicles which operate on them, are considered to be State and local responsibilities. This has produced a

regulatory framework and decision making process for building, maintaining, and inspecting rail crossings, and controlling the traffic which traverses them, that are largely inconsistent from State to State.

Renewed interest in developing light rail transit systems has resulted in some systems which have not been separated from highway and pedestrian traffic. These light rail systems have experienced accident injuries and fatalities from collisions with other traffic. Through the Transit Cooperative Research Program (TCRP), the FTA has funded research projects to improve the safety of light rail operations in shared rights-of way and to provide guidelines that may be used in updating the MUTCD. This is necessary since light rail vehicles interact with motor vehicles and pedestrian traffic in more complex ways than do conventional trains.

Operation Lifesaver

In 1987, the non-profit Operation Lifesaver (OL) program was established at the national level as a public education program designed to reduce the number of crashes, deaths, and injuries at highway-rail crossings and on railroad rights-of-way. The OL program emphasizes education, engineering, and enforcement in crossing safety. In Fiscal Year 1995, Operation Lifesaver received nearly 60% of its funding on a national level from FHWA (\$300,000) and FRA (\$100,000) grants. The rail industry also funds OL at the national level, while State and local OL programs are funded from a wide variety of sources. There is an OL State Coordinator for each State (except Hawaii) who promotes crossing safety by coordinating speaking engagements by trained and certified OL presenters, responding to media inquiries, testifying at public hearings, and distributing educational materials.

The Rail Highway Crossing Safety Action Plan

In the June 1994 Rail-Highway Crossing Safety Action Plan, Secretary of Transportation Federico Pena announced a national goal of reducing railroad crossing accidents and fatalities by 50% within 10 years. Secretary Pena set this ambitious goal to re-emphasize the U.S. DOT's long-term commitment to reducing rail crossing accidents and fatalities. The Action Plan, prepared by FRA, FHWA, FTA, and NHTSA, identified six major initiatives with fifty-five specific actions that Federal, State, and local governments and railroads can take to improve crossing safety. The six major initiatives are:

- I. Increased Enforcement of Traffic Laws at Crossings
- II. Rail Corridor Crossing Safety Improvement Reviews
- III. Increased Public Education and Operation Lifesaver
- IV. Safety at Private Crossings
- V. Data and Research
- VI. Trespass Prevention

The essence of the Action Plan is in fifty-five specific proposals, which identify enforcement, engineering, education, research, promotional, and legislative actions that can be taken to improve safety at both public and private rail crossings for light rail and conventional trains. The U.S. DOT realized that State, local, and private sector implementation of Action Plan recommendations would be critical to the attainment of Secretary Pena's goal, and the Department actively sought input from outside sources including safety experts, transportation associations, railroads, transit agencies, and State DOTs. The U.S. DOT also recognizes that it does not have the regulatory authority to direct States to implement many of the Action Plan

proposals, and must rely on incentives or persuasive evidence to show that implementing the Action Plan proposals serves the best interests of the States, local communities, and railroads. This Highway-Rail Grade Crossing Safety Task Force report should not be viewed as a surrogate for the Action Plan, but as a supplement which focuses on the planning, construction, maintenance, operation, and inspection activities involving rail crossings. The Task Force directed its attention to those grade crossing issues for which there were no well-defined standards, practices, or information. It was in these five problem areas, outside the scope of the Action Plan, that the Task Force felt additional improvements in grade crossing safety could be made.

WHAT HAS THE TASK FORCE DONE

Literature Review

The Task Force began its work by conducting a comprehensive literature review to ensure that all existing information on the five problem areas was considered. The Task Force identified the information gaps that existed, the questions that needed to be asked, and the authorities that needed to be contacted if our understanding of these issues is to be improved.

Outreach

On November 28, 1995, the U.S. DOT published a notice in the Federal Register announcing the creation, scope, and purpose of the Highway-Rail Grade Crossing Safety Task Force. In addition, the notice announced the Department's intent to form a Blue Ribbon Working Group of approximately 20 people who could provide specialized information to assist the Task Force, and the scheduling of three public meetings where interested parties could learn more about Task Force activities and provide input to Task Force members.

To further encourage dialogue with the public, the Department opened all available avenues of communication including a formal docket, a telephone hotline for requesting rail crossing safety publications, a dedicated FAX line, an Internet address, and a mailing address to which further questions or requests for additional information could be sent. The Department received 50 comments to the docket, 386 hotline requests, 54 FAX transmissions, 830 "visits" to the Internet address which included 44 comments for the consideration of the Task Force, and over 40 letters which raised questions or asked for more information. The Task Force considered in its deliberations all information submitted to the Department. To help the States identify rail crossings with potential safety problems, the Department also forwarded crossing locations cited by the public as being dangerous to the appropriate contact person in State transportation agencies. Nearly thirty crossings with potential safety problems were identified through this activity.

The Blue Ribbon Working Group

To assist the Task Force in its work, Secretary Pena called for the formation of a Blue Ribbon Working Group (Working Group) comprised of stakeholders from diverse backgrounds in both the public and private sectors who have technical and operational experience in highway-rail crossing issues. The Working Group was asked to provide individual expert information based on personal experience.

In December 1995, 24 members were selected to serve on the Working Group (see Appendix). On December 14 and January 29, the Working Group met with the Task Force in Washington to exchange observations on the grade crossing initiative and report. Members of the Working Group also accepted assignments to provide input within their particular area of expertise.

Public Meetings

The Task Force sought additional public input in a series of three all-day meetings held at the following locations:

December 19, 1995 - Raleigh, NC
January 3, 1996 - Chicago, IL
January 5, 1996 - Los Angeles, CA

For these public meetings, the Task Force solicited participation from all parties who had demonstrated interest in, or knowledge of, rail crossing safety issues.

The public meetings were quite successful, with approximately 200-250 people attending each one. Secretary Pena participated in the Chicago meeting, and Federal Railroad Administrator Jolene Molitoris participated in both the Chicago and Los Angeles meetings. Each of the public meetings offered a slightly different and valuable perspective on issues of rail crossing safety: the State and local transportation agency viewpoints were predominant in Raleigh and Chicago, and local concerns and transit-related issues were raised in Los Angeles.

At the Chicago public meeting, a number of commentors recommended that train speeds be reduced when operating through populated areas with large numbers of highway-rail crossings. The Task Force considered this issue to be beyond the scope of this report. Nevertheless, the Department recognizes that train operating speeds have important safety implications at grade crossings, and the FRA is separately addressing this issue.

The issue of rail crossing safety was also given broader media coverage as a result of the public meetings, including television interviews and newspaper articles.

WHAT DID THE TASK FORCE FOCUS ON

As noted above, the Task Force examined five potential problem areas related to highway-rail crossing safety. These five problem areas are described below in greater detail:

1.) INTERCONNECTED HIGHWAY TRAFFIC SIGNAL AND HIGHWAY-RAIL CROSSING WARNING DEVICES: Locations where an electrical circuit between the grade crossing warning system and the highway traffic signals allows the normal sequence of highway signals to be preempted to avoid trapping vehicles on the tracks. Inadequate communication/coordination between the responsible highway authority and the railroad sometimes results in highway traffic signal timing that does not permit all vehicles to clear the crossing prior to the arrival of the train.

2.) AVAILABLE STORAGE SPACE FOR MOTOR VEHICLES BETWEEN HIGHWAY-RAIL CROSSINGS AND ADJACENT HIGHWAY-HIGHWAY INTERSECTIONS: Where a highway-rail crossing is relatively close to an adjacent highway, running parallel to the railroad track, limiting distances between the two intersections. This could constrain vehicle storage and result in vehicles that overhang, or are trapped upon, the tracks. This problem area is closely related to problem area number one, Interconnected Signals.

3.) HIGH-PROFILE CROSSINGS AND LOW-CLEARANCE VEHICLES: Highway-rail crossings at which there is an unusually abrupt change in the level of the road's surface as it crosses the tracks, thus posing the risk of a low' clearance vehicle becoming stuck on the tracks.

4.) LIGHT RAIL TRANSIT CROSSINGS: Safety concerns are raised by light rail transit systems that operate in shared rights-of-way with motorists and pedestrians. To date, this most prevalent type of newly constructed grade crossing has not been included in existing highway-rail grade crossing guidelines and standards.

5.) SPECIAL VEHICLE OPERATING PERMITS AND INFORMATION: The information on grade crossing safety given to operators of special vehicles, including oversized and overweight vehicles, through special permits, driver training, and driver certification is often insufficient to prevent these vehicles from safely traversing highway-rail crossings.

The five problem areas reviewed by the Task Force were selected because they were either associated with the tragic accident at Fox River Grove, needed additional focus beyond that afforded in the Action Plan, or illustrated the need for improved coordination/communication that characterizes many rail crossing issues and activities. These problem areas were not selected based on their statistical significance in accident statistics or engineering records. Such records either do not exist or do not address grade crossing safety from the standpoint of the decision making process.

The Task Force addressed each of the problem areas in the context of current practices and recommended specific actions to resolve these problems. The Department's actions are presented in the following chapters as both short-term recommendations (action within 6 to 12 months) and long-term recommendations (action beyond 1 year).

CROSSCUTTING ISSUES

Since the earliest days of railroads there have been planning, construction, maintenance, and inspection procedures associated with grade crossings. The Secretary's Action Plan notes the Department's strong commitment to promote rail safety in these and other specific activities. However, the Task Force identified six themes common to all of these activities. These include a lack of funding, enforcement, coordination, public/private crossings, information, and standards/regulations in the decision making process. This report reflects the efforts of the Task Force to consider grade crossing safety from a systems analysis perspective-one which addresses the six problem areas in the context of these crosscutting issues.

Funding

Funding issues are prevalent in all of the problem areas addressed by the Task Force, and are central to pending legislation on rail crossing safety. U.S. Senator Mike Dewine (OH) has recently drafted a bill which would allow States to establish incentive programs (i.e., payment of bonuses from ISTEA funds) to communities which permanently close crossings. Indiana Senators Lugar and Coats also have recently introduced a bill proposing a change in the formula used to allocate grade crossing safety funds to the States.

During the public meetings and in correspondence, additional funding issues that would require legislation were brought to the attention of the Task Force. These issues included:

- Establishing a tax incentive, i.e., write-off, for corporate entities which might leverage private funds for crossing safety improvements.
- Exempting crossing safety improvement programs from States' Federally-imposed obligation ceilings; exclusion from the ceilings would eliminate competition with other Federally funded State programs.
- Allowing the use of public funds for improvements of private crossings should be promoted if an offsetting public benefit will accrue; how this "offsetting public benefit" will be defined is yet another issue.

In the coming year, the Department will consider these and other funding issues in its legislative proposals for reauthorization of surface transportation programs.

Enforcement

Laws against grade crossing violations are ineffective if they are not enforced and associated with penalties that are strong enough to deter future violations. The public, enforcement officers, and judges all need to be aware of the danger associated with grade crossing violations. Grade crossing safety systems cannot prevent collisions if the parties that use and control these crossings do not act responsibly.

Public commentors to the Task Force suggested that penalties associated with crossing violations should include fines that increase with repeated offenses, culminating in the forfeiture of the driver's license for especially serious violations. Localities may wish to re-invest the fines collected by the courts in grade crossing education and enforcement as an additional safety measure. In addition to paying fines, persons guilty of grade crossing violations should attend traffic school to learn about crossing safety. Input to the Task Force included suggestions that States enact legislation to establish and/or increase fines and penalties for grade crossing violations, including the loss of a driver's license for repeat offenders. This legislation could be modeled after similar laws in Texas, California, Virginia, Illinois, and other States.

Photo enforcement systems have been successful in deterring transit crossing violations in the United States, Europe and Canada. Photo enforcement systems involve the use of high-resolution cameras to photograph violators and provide one or more photographs of the vehicle, its license plate, and the driver's face as the basis for issuing a citation. Superimposed onto each photograph is the date, time and location of the violation, as well as the speed of the violating vehicle and the number of seconds of elapsed time since the crossing warning lights were activated.

The use of photo enforcement for speed and crossing violations has significantly reduced accident rates wherever it has been used. The Los Angeles County Metropolitan Transportation Authority's (MTA) photo enforcement demonstration project has reduced violations at highway-rail grade crossings by 92%. Train/automobile accidents at light rail, gated highway-rail crossings dropped over 70% as a result of enforcement activities. The Task Force found that this technology shows great promise in stepping up enforcement.

Coordination

The Task Force reamed that improved coordination was needed in the decision making and implementation processes associated for all five problem areas. Input to the Task Force from the Working Group and the public at-large called for coordination of warning signal inspections, track and highway maintenance, and designating problematic crossings for special permit vehicles. Better coordination was called for in setting standards, designing highway-rail crossings, and alerting authorities to rail crossing emergencies. The Task Force also received recommendations that State DOTs should incorporate grade crossing safety into their Safety Management Systems for maximum exposure and effectiveness; this recommendation was included in the Department's 1994 Action Plan.

A lack of coordination in these areas has frequently resulted in the false assumption that "someone else is taking care of the problem" when, in fact, no one is. Even though many of the actions taken by individual parties were quite thorough, these actions were less effective than they could have been because they took place independently. For example, railroad warning signals that "meet the standard" for rail inspectors might not adequately consider the demands of highway traffic, and traffic signals that seem adequate to highway engineers might pose problems for rail operations. Joint inspections could also detect serious problems that otherwise go unnoticed.

Public/Private Crossings

Determining responsibility for public/private crossings constitutes a serious jurisdictional problem. The FRA has authority in all matters concerning railroad safety, and can set standards for private crossings. States and local highway agencies frequently have no involvement in, or responsibility for, private crossings. In January 1995, the FRA issued regulations requiring periodic maintenance, testing, and inspection of automatic warning devices at all highway crossings over tracks of railroads which are a part of the Nation's general railroad system, including private crossings.

Traditional Federal crossing safety improvement funds cannot be expended for improvements at or for private crossings. ISTEA did make limited high-speed rail funds available for crossing safety improvements where such improvements would facilitate high-speed rail operations including private crossings. Additional program options of this type have been precluded by concerns over spending public funds for private infrastructure. In general, administrators of public funds are very concerned about expenditures that might be viewed as "improving" personal property. Identifying private crossings as "unsafe" also raises significant questions of legal liability for the property owner.

One of the U.S. DOT's Action Plan commitments is to investigate, develop, and define responsibilities and standards for private crossings. A public hearing will be held to consider comments on this issue.

Information

The general lack of good information databases on grade crossings was often cited as an impediment to developing and managing necessary crossing safety improvement programs addressing high-profile crossings, interconnected signals, and light-rail crossing accidents. Railroad, State and local officials recommended the development and maintenance of improved databases, including increased availability to State and local agencies and the private sector (e.g., on the Internet).

The U.S. DOT Bureau of Transportation Statistics will investigate how highway-rail crossing data might be compiled as part of their larger data collection and dissemination activities for the Department.

Standards/Regulations

The issue of rail crossing standards and regulations has two components. The first component is that, in some cases, standards and regulations for rail crossings either do not exist or they are inconsistent. Transportation agencies, professional associations, and private sector firms concentrate upon their primary areas of operation or responsibility and give less attention to the interfaces which occur at the boundaries. In addition, standards that were developed for one mode or one jurisdictional application may not be transferable to other modes or jurisdictions. The second component of standards and regulations involves their application by professional engineers, private companies, and public service agencies. These parties rely upon recommended practices rather than more stringent regulations in conducting their activities. Many of the recommendations in this report emphasize the passage of State and local legislation and ordinances and a stronger focus on recommended or best practices to enhance grade crossing safety, rather than reliance on Federal regulatory solutions.

Communication/Education

Since multiple parties use and are responsible for grade crossings, communication among these parties and an understanding of their respective roles and activities are essential. In practice, some grade crossing activities are carried out in an environment that lacks mutual awareness and dialogue. Those rail crossing actions that take place without adequate information exchange or consideration can compromise safety.

The need for improved communication and education on rail crossing safety exists for all parties and all issue areas. The U.S. DOT has emphasized information sharing in the Action Plan, but Action Plan products must reach State and local transportation agencies, legislators, law enforcement officials, emergency service personnel, the private sector (railroads, motor carriers, industry suppliers, and labor unions), and the general public. The challenge of reaching this diverse audience is further compounded by the breadth of topics that must be addressed: best practices, operating standards, organizational structure, program eligibility, legal liability, etc. The range of audiences and issues that must be addressed will require increased Departmental efforts in communication and education along several fronts, as reflected in this report's recommendations and in Section X: U.S. DOT Next Steps.

INTERCONNECTED SIGNALS AND STORAGE

WHAT DID THE TASK FORCE LEARN ?

Input from Surveys and Public Meetings

During the Task Force literature review and in planning for the first public outreach meeting in Raleigh, NC, it became apparent that although we had been treating interconnected signals and storage as two separate focus topics, they were in fact very closely related. The Task Force and Blue Ribbon Working Group therefore decided to combine the two topics for discussion at the three public outreach meetings and, to the extent possible, in the Task Force report to the Secretary.

To facilitate discussion at the public outreach meetings, seven questions were developed on the combined topic of interconnected signals and storage. The questions were used as a guide during the discussions. Additional responses from the States and railroads were sought through surveys by AASHTO and the Association of American Railroads (AAR) of their respective members. The following summary of what the Task Force reamed is based on discussions with the Blue Ribbon Working Group, discussions at the public outreach meetings, and responses to the AASHTO and AAR requests for information. The seven questions put before the public are listed below with a summary of findings:

Standards and Guidelines

QUESTION: What standards/guidelines (national or local) are used to determine if grade crossing warning devices and nearby highway traffic signals should be inter-connected ?

An overwhelming majority of the States use the standards in the MUTCD which indicates that interconnection should be considered when the highway intersection traffic control devices are within 200 feet of a grade crossing. The MUTCD further indicates that except under unusual circumstances, interconnection should be limited to only locations falling within the recommended 200 feet. Responses received indicate that the MUTCD standards are inadequate and need to be updated. The 200-foot distance is entirely subjective, and many more factors unique to each intersection location need to be considered in the decision. Some States have interconnected signals and warning devices as much as 500 feet apart.

The Institute of Transportation Engineers (ITE) has been developing a "Recommended Practices for Interconnected Signals". It will promote a more objective approach to making the decision to interconnect the signals and warning devices. This document should be available later this year.

Process Coordination

QUESTION: Is there a formal coordination process involving the responsible highway agencies and the involved railroad(s) that guides the planning, design, and construction of interconnected signals ?

There are very few formal coordination processes in place now. Many respondents stated that informal coordination processes were utilized, but these varied significantly. Where coordination processes exist, the coordination is typically initiated by the State or local highway authority.

There is a much higher degree of confidence that coordination is occurring between the railroads and the State highway authorities than between the railroads and the various local highway authorities with jurisdiction over local roads and traffic signals.

Even though several States have given a specific State regulatory agency responsibility for the overall coordination of crossing safety improvements between highway and railroad authorities, the public input indicates that there is inadequate coordination and cooperation between highway and railroad authorities regarding highway-rail grade crossings.

Signing/Enforcement

QUESTION: What steps are taken to encourage vehicles not to stop on the tracks ?

The "DO NOT STOP ON TRACKS" sign is used by almost all States; however, there is concern that the sign is not effective due to inattention by the public and lack of enforcement activity. Several States have used highway traffic signals on the approach to the railroad crossing along with "STOP HERE ON RED" signs. The public perception of a lack of danger due to relatively infrequent train movements is an obstacle to overcome, and there is little confidence in the enforcement authorities' ability to effectively keep motorists from stopping on the tracks. Current technology involving photo enforcement may provide an effective means of keeping motorists off the railroad track.

There was consensus that public information/education materials need to incorporate information on interconnected signals and available storage space.

Section 112 of the Hazardous Materials Transportation Authorization Act of 1994 prohibits the driver of a commercial vehicle from driving the vehicle onto a highway-rail grade crossing without having sufficient space to drive completely through the crossing without stopping. The FHWA recognizes that there are locations where the combination of a short storage distance between the tracks and a nearby highway intersection, and restrictive traffic controls at the intersection, may make it difficult for a driver to comply with both the Act and the traffic control devices. The FHWA is currently developing regulations to implement this section of the Act and address this issue.

Interconnected Signal Inspection

QUESTION: How often are interconnected signals inspected to determine if they are performing properly ? Are there any standards or guidelines for properly performing these inspections ? Is any effort made to coordinate the inspection with the other party (railroad or highway agency) ? Public response indicated that railroads are performing monthly inspections of interconnected signals in accordance with the January 1995 Federal Railroad Administration regulations (44 CFR 234). A few highway authorities are periodically inspecting interconnected signals in time frames that range from two months to annually. There are no formal standards used by transportation agencies to review interconnected signals, but some informal guidelines were referenced. Several States indicated that local highway authorities, and not State authorities, are totally responsible for traffic signal operation and maintenance throughout the State. It was the general consensus that there is little to no coordination between highway and railroad authorities for joint operation/maintenance reviews of interconnected signals. This lack of coordination is further compounded in States where operation and maintenance of most traffic signals is the

responsibility of local highway agencies. It was also the consensus of public respondents that independent reviews of interconnected signals by highway or railroad authorities were ineffective and that joint reviews need to be performed.

Signal Timing

QUESTION: Is there formal coordination between the highway agency and railroad when changes are made to signal timing or railroad operations ? Explain.

Input to the task force suggests that public/private interaction ranges from coordination at all times to no coordination at all, with the majority of responses indicating there was no coordination at all. There was no consensus on whether or not all changes need to be coordinated between authorities, but there was consensus that coordination must be improved.

Storage Space

QUESTION: Is consideration given to operations/storage space locations where there are passive devices (e.g., stop signs, cross bucks) at either the grade crossing or the nearby highway-highway intersection, or at both locations ?

Some States have addressed this issue and gave examples of providing for through traffic movement at highway-highway intersections for vehicles crossing the railroad tracks, or providing for an all-way stop condition at this intersection. Many States have not specifically discussed and taken actions for these types of intersections.

The magnitude of the problem at these types of intersections is unknown. Since the intersections cannot be interconnected, there would appear to be greater potential for accidents. However, these intersections would generally have less highway and train activity and thus less exposure to potential accidents.

Storage Considerations in Design

QUESTION: When a highway parallel to a railroad is reconstructed (especially if it is widened on the railroad side), is the remaining storage space a design consideration ?

The overwhelming majority of States indicated that, yes, the remaining storage space is a design consideration. Some indicated that it is not. It appears that although this issue is considered by the majority of the States, there are also issues of increased social and economic impacts of widening on the side opposite the railroad tracks. Widening occurs more frequently on the railroad side of the reconstructed highway.

RECOMMENDATIONS

A. Short-Term Recommendations

1.) State transportation agencies (or other State agencies, if appropriate) should formally agree to be the focal point in the State to ensure proper coordination between highway authorities and railroads regarding the interconnection of grade crossing warning devices and highway traffic

signals, and consideration of the storage distance between the tracks and the parallel highway. The responsibilities of the agency, as a focal point, would be to:

- a.) develop, distribute, and continually update a list of State and local highway authorities and railroad contacts who should be involved in the planning, design, construction, operation, and inspection of grade crossing warning devices interconnected with nearby highway traffic signals;
 - b.) serve as a clearinghouse for collecting and disseminating to State and local highway authorities and railroads all pertinent information necessary for the planning, design, construction, and safe operation of grade crossings in close proximity to highway-highway intersections;
 - c.) develop guidelines which recommend that, on at least an annual basis, State and local highway authorities and railroads and/or transit agencies conduct joint inspections of the timing and operation of highway traffic signals that are interconnected to nearby grade crossing warning devices; and,
 - d.) coordinate with State/local school transportation officials, operators of public transit or intercity buses, and trucking organizations to help ensure that drivers are familiar with the operation of interconnected signals and are aware of any storage space limitations at grade crossings on their routes. This information exchange would be carried out in cooperation with Operation Lifesaver.
- 2.) State and local highway authorities should initiate engineering studies to determine if safety improvements are warranted at grade crossings near highway-highway intersections where there is no interconnection and where there is limited storage distance. Emphasis should be given to locations with STOP sign control at the highway-highway intersection, where storage space is less than that required to accommodate the longest legal vehicle permitted to use the highway, and where accident potential is greater due to high volumes of highway and/or rail traffic.
 - 3.) State and local highway authorities, through coordination with the railroads, should ensure that storage space is a significant consideration early in the planning and design processes where physical changes are being proposed to the highway or railroad at interconnected signal locations.
 - 4.) FHWA and FRA field staff should initiate regional conferences throughout the country for highway agencies and railroads to specifically discuss grade crossing safety issues, including interconnected signals and storage practices.

B. Long-Term Recommendations

- 1.) The FHWA should convene a technical working group that includes representatives of rail crossing safety organizations to review existing standards and guidelines and develop new ones, if appropriate, on grade crossing safety including the following issues: when interconnected signals should be used, minimum clearance green time, the existing 20-second minimum warning time, critical storage distance, use of near side traffic signals, joint highway agency/railroad/transit inspections, and stopping on tracks. One of the outputs of this group could be recommended additions and/or changes to the MUTCD, the Railroad-Highway Grade Crossing Handbook, or other appropriate guidance documents. The group should be established and hold its initial organizational meeting by June 1, 1996, and submit proposed standards/guidelines within a year.

HIGH PROFILE CROSSING

WHAT DID THE TASK FORCE LEARN ?

Problems posed by high profile crossings for low-clearance vehicles can be grouped into four categories: Vehicles; Crossing Design; Crossing Maintenance; and, Dealing with Crossing Problems.

Vehicles

Low-clearance vehicles, i.e., those low to the ground relative to the distance between axles, pose the greatest risk of becoming immobilized at highway-rail crossings from contact with the track or highway surface. With the exception of some specialized vehicles (e.g., tank trucks, piggyback trailers), there is little standardization within the vehicle manufacturing industry regarding minimum ground clearance. Instead, manufacturers are guided by the requirements of shippers and operators. The Specialized Carriers & Rigging Association (SC&RA) provides a useful guide which summarizes applicable State laws and regulations. Several States refer to "...vertical body or load clearance of less than 1/2 inch per foot of the distance between any two adjacent axles or in any event of less than 9 inches measured above level surface of roadway..." when defining equipment with restrictive ground clearance.

Crossing Design

The vertical alignment of highways and railroads at highway-rail crossings has never been an area subject to regulation or oversight by Federal agencies. Two associations publish references which provide guidance to the highway and railroad engineering communities. Guidance to railroads is provided by the American Railway Engineering Association (AREA) in their Manual for Railway Engineering.

The recommended practice for new construction states:

....The surface of the highway shall be in the same plane as the top of rails for a distance of 2 feet outside of rails..." and "... It is desirable that the surface of the highway be nor more than 3 inches higher nor 6 inches lower than the top of nearest rail at a point 30 feet from the rail, measured at right angle thereto, unless track superelevation dictates otherwise...

Highway engineers receive identical guidance in the AASHTO publication titled, A Policy on Geometric Design of Highways and Streets.

When track is being added or reconstructed through a crossing, the AREA Manual also states, "An agreed upon profile, railroad and highway, should be established between the operating railroad and the road authority."

Most States reference the AASHTO recommended practices. Those States which have regulations or statutes can be divided into two categories, i.e., those which define their requirements in (1.) generalized terms such as, "maintain a safe vertical relationship," and (2.) quantitative terms. Most States in the latter category have simply adopted the AASHTO recommended practices with minor variations.

Professional discussion regarding crossing profiles is most likely to occur between the railroads' public projects engineers and their counterparts among State highway planning engineers. However, warning devices, and not crossing profiles, are usually addressed. It is a given that the

AREA and AASHTO recommended practices will be adhered to if practicable, but additional measures to comply are seldom initiated or requested.

During design, existing site-specific alignments and grades (versus the expense and clearances necessary to effect significant changes) often prevail over the guidelines. There is no sanction or penalty for failure to comply, and small chance that any review authority will overrule. Among officials attending technical discussions conducted by the Task Force, there was general recognition of the existence of the AREA and AASHTO guidelines, but there was also general acknowledgment that these guidelines apply only to "design" efforts for new or reconstructed crossings, and not to construction or maintenance.

Crossing Maintenance

Two constraints often apply to the maintenance of grade crossing profiles: Drainage requirements and resource limitations. Coordination of maintenance activities between rail and highway authorities, especially at the city and county level, is frequently informal and unstructured, and is too often inconsistent. Even when the need to coordinate has been identified, there is often a lack of knowledge regarding whom to contact.

In some cases, highway authorities have become aware of increases in track elevations (a by-product of track maintenance) only after the fact. As a result, even if State standards for highway-rail crossing profiles exist, there is little opportunity to enforce them. Often an individual increase in track elevation may not violate a guideline, but successive raises may ultimately create a high-profile crossing. Railroads also typically do not have expertise in paving. After track maintenance, railroads may contract for resurfacing and tapering of the highway approaches in order to accommodate a track raise. There is seldom any in-progress review of these efforts by highway authorities, and the final results are sometimes deemed insufficient. At least one State (North Carolina) has put railroads on notice that the State will follow-up all track maintenance activities and correct grade discrepancies if the State is informed in advance of the planned maintenance activities.

When railroad participants in the Task Force public meetings were questioned about the need to alter grades, i.e., to raise track through crossings during maintenance, their response was two-fold: First, to undercut (the remedial measure which will return track to pre-maintenance elevations) would substantially raise track maintenance costs; and second, there is no post-maintenance standard (crossing profile) to use when planning maintenance activities and against which results can be assessed. (Note: Previously cited AREA/AASHTO practices are for the design of new or reconstructed crossings.)

Dealing with Crossing Problems

Once en route, operators of low-clearance vehicles have few resources to assist in making decisions regarding the route ahead. Signing regarding high-profile crossings is inconsistently applied, with some notable exceptions (e.g., the State of Florida is measuring all crossing profiles and is signing those that are problematic for low-clearance vehicles). However, there is no Federal standard for an advance warning sign, therefore, its appearance to motor vehicle operators varies from State to State. The FHWA is currently studying the development of a standardized advanced warning sign for high profile crossings.

RECOMMENDATIONS

A. Short-Term Recommendations

- 1.) The FHWA should approve a standard advance warning sign for high-profile crossings and amend the Manual on Uniform Traffic Control Devices accordingly.
- 2.) FRA, working with FHWA, States and the rail industry, should define the information needed by the operator in the event of a vehicle hang-up, which should be included on a crossing identification sign.
- 3.) State and local highway agencies, working with railroads, should identify problem high-profile crossings, i.e., crossings with a history of, or evidence of, vehicle hang-ups, by reviewing accident data and consulting with highway engineers, local railroad officials, truckers, and public officials. Once identified:
 - a.) Standard advance warning signs and a crossing identification sign (see previous recommendations) should be conspicuously installed.
 - b.) As States identify high-profile crossings, the FRA should retain the information in the U.S. DOT/AAR National Highway-Rail Crossing Inventory.
 - c.) States and/or FRA should enable State special permit offices to electronically access rail crossing databases and develop maps that identify problematic rail crossings to delineate routes for special permit vehicles.

B. Long Term Recommendations

- 1.) The FRA, working with the FHWA, should convene a Working Group composed of highway officials, manufacturers of low-clearance vehicles and the users of such vehicles, and the railroads to investigate the feasibility of developing a nationwide classification system that would assign compatibility codes to crossings and vehicles for the purpose of helping low-clearance vehicle operators avoid getting hung up on high-profile crossings. Within one year, the Working Group should present its findings for possible implementation. Examples of areas of focus for the Working Group include the following:
 - a.) Vehicle characteristics such as: wheelbase, actual ground clearance at points between adjacent axles, and front and rear overhangs and heights above ground. Based on these, appropriate vehicle classification codes may be determined.
 - b.) The feasibility of inspecting highway-rail crossings to measure their road surface profiles.
 - c.) The feasibility of developing an appropriate and readily understandable classification code.
- 2.) The FRA should work with FHWA and the railroad industry and national/State transportation associations to develop guidelines for track and highway maintenance that establish maximum thresholds for post-maintenance vertical alignment.

LIGHT RAIL CROSSING ISSUES WHAT DID THE TASK FORCE LEARN

System Design and Construction

Light rail transit (LRT) has become an increasingly popular mode of transportation in major U.S. cities due to its relatively low capital cost, its ability to operate both on and off streets, and its capacity to transport passengers with frequent stops in heavily congested urban areas. Sixteen cities have operational light rail lines, and several cities are building extensions to existing lines or are planning new systems.

The majority of the LRT systems operate portions of their systems within unrestricted rights-of-way on city streets, in mixed traffic, within median strips, and in pedestrian malls. This results in numerous, and sometimes continuous, roadway-light rail grade crossings. In some cases, light rail transit systems share grade crossings with mainline railroads.

Construction of a light rail transit system, especially in heavily urbanized areas, requires a great deal of cooperation among all parties. The operation of LRT systems in shared rights-of-way increases the potential for accidents with motorists, pedestrians, and bicyclists. Many of the safety problems result from a general lack of awareness and the failure of motorists and pedestrians to obey crossing warning and traffic control devices.

ISTEA directed the FTA to initiate a rulemaking that directs the States to oversee the safety of "rail fixed guideway systems". A final rule was issued on December 27, 1995, mandating that States designate an oversight agency to require, review, approve, and monitor system safety programs for rail fixed guideway systems. Rail crossing accidents and hazardous conditions for light rail systems are part of this State Safety Oversight Program.

Standards

Nationwide standards for highway-rail grade crossings are contained in the MUTCD, and its standards and guidelines for crossings have been based largely on practices within the railroad industry. Because the existing standards were not developed for light rail roadway-rail grade crossings, many of the traffic control and warning devices applied to light rail systems may not adequately address their operating characteristics.

Many roadway-light rail grade crossings occur in medians or shared right-of-way in downtown city streets where there are no crossing gates. Existing MUTCD standards do not address these situations, nor are there any guidelines for interconnected signals for light rail and traffic signals. The only recommended practices for preemption of traffic signals at or near railroad grade crossings are those developed by the ITE. However, these ITE guidelines for preemption are relevant to light rail only when automatic gates are used.

Through Transit Cooperative Research Program (TCRP) Project A-5, the FTA has funded an effort to evaluate the safety and operational experience of light rail transit systems operating in the street at speeds that do not exceed 35 mph. One of the products of this research is a new draft chapter for the MUTCD titled "Traffic Control Systems for Light Rail-Highway Grade Crossings." In addition to the proposed MUTCD chapter, the A-5 Project produced a Final Report titled "Integration of Light Rail Transit into City Streets" that identifies the most effective traffic

control devices, public education techniques, and enforcement techniques to improve safety for rail passengers, motorists and pedestrians. Information contained in this report includes light rail transit planning principles and guidelines, a potential methodology for evaluating traffic engineering treatments, and a summary of system safety and operating experience.

In June 1995, the MUTCD Highway/Railroad Technical Committee voted to include a chapter on light rail transit traffic control devices in the 1997 version of the MUTCD. The chapter was finalized in a recent Committee meeting and will be sent to the sponsoring agencies (FHWA, ITE, AASHTO and others) by March 1, 1996. At the June 1996 meeting of the MUTCD Highway/Railroad Technical Committee, comments from these agencies will be incorporated into the text. The document then will be made available for public comment in the Federal Register. While specific guidelines already exist for most motor vehicle traffic controls, there are comparatively few guidelines for pedestrian warning systems. Additional research and demonstration projects need to be conducted in this area. TCRP Project A-13 "Light Rail: Pedestrian and Vehicular Safety" will continue the research started in A-5, but will look at transit operations over 35 mph and will include additional light rail systems that have begun operations in the last two years.

Accident Statistics

National statistics for highway-rail grade crossing accidents have traditionally omitted light rail accidents, although several State oversight agencies do collect data on these accidents. These data are typically not detailed enough to evaluate specific causes of light rail crossing accidents. The FTA collects data on transit accidents through the Safety Management Information System (SAMIS). Prior to 1995, transit accident data collected by SAMIS did not categorize grade crossing accidents. The 1995 SAMIS report will distinguish grade crossing accidents from other types of accidents. However, the SAMIS data are not detailed enough to isolate specific causes of light rail crossing accidents.

In an attempt to provide more information on light rail crossing accidents, the FTA's TCRP Project A-5 proposed an accident data base containing detailed descriptions of light rail accidents from 10 light rail systems where causes of accidents, such as left turns in front of trains, encroachment, etc., were recorded. At present, there are no mechanisms or financial resources available to collect accident data in a format suggested by TCRP Project A-5.

RECOMMENDATIONS

A. Short-Term Recommendations

- 1.) The U.S. DOT should endorse the new MUTCD chapter on "Traffic Controls for Light Rail-Highway Grade Crossings".
- 2.) Rail transit agencies should begin the process of communicating with public safety agencies as early in the planning process as possible to ensure that safety concerns are appropriately considered in the design and eventual operation of the transit system.
 - a.) The FTA should instruct local transit planners to put considerations of crossing safety above the incorporation of attractive urban design elements. For example, areas at grade crossings where pedestrians can cross the tracks should be clearly identified even if that means applying markings on expensive design elements or foregoing aesthetic additions such as trees or landscaping.

3.) In all Full Funding Grant Agreements involving light rail design and construction, the FTA should include language that addresses priority for light rail transit systems in interactions with other vehicles. The FTA should require the grantee to include elements in the project scope of work which, where appropriate, provide for the priority of the light rail system in interactions with other vehicles. For transit systems that are locally funded, the FTA should recommend that local traffic engineers and transit planners address priority issues.

B. Long-Term Recommendations

1.) Through the Transit Cooperative Research Program, FTA and the transit industry should develop a process to collect, analyze, and disseminate detailed light rail accident data.

2.) The FHWA, FRA, and FTA should review current grade crossing safety documents, such as the Grade Crossing Handbook and the MUTCD to ensure that light rail crossing issues are appropriately incorporated.

3.) In cooperation with the FTA, the ITE should develop guidelines for priority of light rail vehicles operating in city streets as part of its ongoing effort to identify recommended practices in this area.

4.) In cooperation with the National Council of State Legislators and the National Governors' Association, States with light rail systems should enact model legislation for penalties associated with light rail crossing violations based upon existing laws in Texas, California, Virginia, and other States. To encourage enforcement, the legislation should include provisions for citation revenues to be shared with the State, operating agency (transit authority or railroad) and the city/county of operation.

SPECIAL VEHICLE OPERATIONS AND INFORMATION

WHAT DID THE TASK FORCE LEARN ?

Physical and Operating Characteristics

While Federal size and weight limits apply to conventional commercial vehicles traveling on the Interstate System and National Truck Network, all States issue special permits and regulate the operation of oversize and overweight vehicles with non-divisible loads. Nearly 1.8 million special permits were issued by States in 1993. Special permit vehicles known as "superloads" may encounter problems at rail crossings because of their following physical characteristics:

HEIGHT: limited by route
WEIGHT: 120,000 lbs. GVW and above
WIDTH: 14 feet or more
LENGTH: 120 feet or more

The physical characteristics of superload vehicles exceed those of the conventional vehicles which highways are designed to accommodate. As a result, the physical and operating characteristics of these superload vehicles, and other specialized vehicles, may present the following safety problems at grade crossings:

- Special vehicles using a deep-well or "low-boy" chassis to achieve vertical clearance when transporting large loads through tunnels and under bridges may not have sufficient road clearance to traverse high-profile rail crossings.
- Vehicles, even those falling within overall Federal limits, may exceed the storage space available between highway-rail crossings and nearby highway-highway intersections.
- The placement of crossing warning devices and other physical infrastructure may impede the turning movements of vehicles of excessive length and/or width, causing them to become stuck or delayed while traversing rail crossings.
- The size, weight, speed, and acceleration abilities of some special permit vehicles may not be compatible with either warning device timing or with available storage space.
- There is little, if any, training on rail crossing safety practices for either operators of the special permit vehicles or the drivers of escort vehicles that may be required to accompany these vehicles.
- Most States do not have requirements or processes in place for drivers of special permit or escort vehicles to notify the proper authorities when rail crossing problems are encountered.

Special Operating Permit Practices

While there are model requirements for special permit vehicles, these requirements often do not address grade crossing considerations for oversize and overweight vehicles in detail. Using special permit vehicles with low ground clearance as an example (defined by the Uniform Vehicle Code and Model Traffic Ordinance [UVC] as equipment with a vertical body or load clearance of less than 9 inches above a level roadway surface), the UVC model regulations only suggest that such vehicle operators notify the railroad station agent of their crossing within a reasonable time so the railroad can provide proper protection (flagmen) at the crossing. Over the years, 17 States adopted the "low-clearance" definition of the UVC model regulations and 16 States adopted the "notification" elements of the UVC model; 14 States have adopted both provisions.

The UVC does not address extra-wide vehicle operations at rail crossings, but it does provide a model regulation for slow moving equipment:

No person shall operate or move any crawler-type tractor, steam shovel, derrick, roller, or any equipment or structure having a normal operating speed of 10 miles per hour . . . upon or across any tracks at a railroad grade crossing without first complying with this section.

Currently 19 States have adopted language similar to that in the UVC model regulation. Of these, 14 have adopted the 10 mph limit recommended in the UVC, and five have adopted other limits. When carriers seek permits for vehicles with low ground clearance or other weight or dimensional considerations, most States are at a loss to specify a route to avoid problematic rail crossings because the States and railroads do not have the data, processes, and/or procedures to provide such information. Maps used to define special vehicle routes typically do not identify rail crossings, nor do they contain notations of crossings with high profiles or limited widths, storage space, or signal phasing times that could be problematic for vehicles that are extra wide, high, long, low, or heavy. These crossing characteristics are usually not captured in State transportation agency inventories of physical infrastructure and even when they are, they are generally not provided to, or used by, the agencies that issue special permits. Updating and maintaining this data base, when it exists, constitute additional problems.

Driver Licensing Considerations

Current Federal law requires that each State have minimum standards for the licensing of commercial drivers. To obtain a Commercial Driver License (CDL), the driver must pass a knowledge and skill test. The knowledge test includes questions in 18 specific areas (e.g., driving safety, transporting cargo or passengers, hazardous materials, etc.). To help drivers prepare for the test, DOT has published a Model Commercial Driver License Manual as a study guide. This manual is currently in its second revision. The first manual (January 31, 1989) did not address the issue of rail crossing safety. In section 2.12, the second edition of the manual (1994) included one page on rail crossings. The section, however, does not devote adequate attention to rail crossing safety, nor does it address such issues as procedures to take off the vehicle gets hung up on tracks.

Each State tests drivers for a CDL, using a subset of questions developed by the American Association of Motor Vehicle Administrators (AAMVA). From a pool of 600 questions, Federal regulations require a 30-question test of 18 knowledge areas (rail crossing safety is not considered to be a knowledge area). Most States, however, use a 50-question test, taking the questions from the pool of 600. Considering the brevity of the rail crossing section, it is unlikely that rail crossing questions will appear on the States' CDL test.

Escort Vehicle Services

There has been little emphasis placed on training in rail crossing safety for commercial vehicle operators and the drivers of escort vehicles that may be required to accompany them. Because of the high turnover rate in drivers of commercial and escort vehicles, rail crossing education must be a continuing process. While a State-supported education program might not reach all available drivers, the training and testing through certification programs would certainly reach them. Currently there are no provisions in the UVC relating to escorts for oversize/weight vehicles (e.g., certification, duties and responsibilities). Presently, there are only five States with training requirements for escort credentials. At least one other State (North Carolina) is considering setting up escort accreditation programs in community colleges.

In practice, the primary responsibilities of escorts are limited to checking that sufficient roadway clearance exists to accommodate the height and width of the special permit vehicles. Rail crossing safety is generally not included in the training or certification of escort vehicle drivers, resulting in a frequent lack of attention by the escort to discern the potential for the permit vehicle to become "trapped" at a rail crossing.

Enforcement

When State special permit offices do delineate routes for special vehicles, the operators of these special vehicles are often under no obligation to follow these exact routes. When routes are specified and required and the drivers deviate from them, the operators are seldom ticketed because routing infractions are rarely noticed or emphasized by law enforcement officials. In general, fines for grade crossing violations by operators of special permit vehicles are not high enough to serve as a deterrent. During the Chicago public meeting when the issue of enforcement was raised, Transportation Secretary Pena voiced his concern that judges were essentially creating a second level of judicial decision when they did not address the fact that a violation had occurred which could have fatal and even catastrophic consequences but, instead, based their ruling only on the circumstances surrounding the incident.

Communications

Drivers of special permit and escort vehicles would also benefit from States using their special operating permits to list phone numbers to call in the event of rail crossing emergencies. Following recent accidents at rail crossings involving low-clearance vehicles, several States are attempting to provide drivers with relevant telephone numbers.

The UVC does not contain any model language regarding the type of communication devices (e.g., citizen band radio, cellular telephones) required of escorts that would assist in the notification of railroad companies in the event of a problem at a rail crossing. However, at least one State (Texas) has established a 1-800 Emergency Railroad Crossing Hotline. Details regarding the hotline are published in the permit rules and regulations and the number is published on the permit itself. In addition, warning signs at high-profile crossings alert the driver to the presence of such a crossing, as well as identifying the emergency number and the crossing location in the event the vehicle is hung up on the tracks.

RECOMMENDATIONS

A. Short-Term Recommendations

- 1.) State directors of pupil transportation should encourage local school boards and school bus contractors to include crossing emergency numbers and an identification number giving the crossing's exact geographic location in school bus dispatch books provided to drivers and substitutes.
- 2.) State permit offices should list emergency telephone numbers on all special vehicle operating permits; i.e., the telephone numbers appropriate for the railroad(s) being crossed.
- 3.) State permit offices should provide operators of "superload" special permit vehicles with relevant telephone numbers so that they can notify railroads and arrange for flag-protection when planning for or traversing any rail crossing. The vehicle operator and the railroad should confirm exactly (by crossing number or on-the-ground inspection) the identity of the highway-rail crossing(s) involved.
- 4.) The Commercial Driver License manual and CDL tests developed by States should contain expanded discussion of rail crossing safety. Currently, the CDL manual discusses grade crossing safety only for movements of hazardous materials.

B. Long-Term Recommendations

- 1.) States should develop certification programs for escort vehicle drivers with training exercises in crossing safety.
- 2.) State special permit offices should ensure that operators of both escort vehicles and special permit vehicles should be required to maintain a "real time" communications link with their dispatcher or a central authority.
- 3.) If high-profile crossing and commercial vehicle classifications are developed by the Working Group convened under Long-Term Recommendation 1 in the High-Profile Crossings problem

area, States should implement labeling and compliance procedures to carry out this classification process.

U.S. DOT NEXT STEPS

U.S. DOT Modal Agency Commitments

The headquarters office of each U.S. DOT modal agency will transmit copies of the final report to their field offices, with specific recommendations for implementing appropriate recommendations in the report. Each U.S. DOT modal agency will cooperate with other modal agencies, as appropriate, to assist in implementing the recommendations in the report. It is hoped that this report will stimulate the discussion that must take place among the many parties with responsibility for grade crossings if accidents and fatalities are to be reduced through cooperative efforts. But the Department is also committed to act upon the recommendations of this report in the "next steps" identified below.

FHWA

The FHWA recognizes that without the cooperation and active involvement of the States, implementation of many of the Task Force recommendations will be difficult. The FHWA will, therefore, work to actively engage AASHTO and the individual States in developing an effective plan to implement recommendations that necessitate direct or cooperative actions by State and/or local highway agencies.

The FHWA will meet with the FRA to develop the process for implementing the FHWA long-term recommendation to convene a technical working group to evaluate current standards and guidelines for a variety of grade crossing technical issues.

Selection of working group members and development of an implementation schedule should be accomplished by June 1, 1996, with the group's product targeted for completion by June 1, 1997. The FHWA will also coordinate with FRA to develop a strategy for initiating regional conferences throughout the country for discussing grade crossing safety issues.

FRA

In conjunction with efforts by the FHWA, the FRA will encourage State and local transportation agencies and railroads to work closely together on rail crossing rehabilitation. Through cooperative efforts with these parties, FRA will attempt to develop a process that facilitates improved communications between railroads, local officials and emergency and fleet dispatchers. At a minimum, the exchange and/or publication of contact lists, and/or computer files, and/or access procedures (minimally, names and/or phone numbers) for routine and emergency use will be addressed. Agreements should be reached on definitions of terms, problem areas, procedures and responsibilities.

FTA

The FTA will work with the American Public Transit Association, the Institute of Transportation Engineers and other transportation organizations to disseminate the recommendations from TCRP Project A-5 to transit agencies, and related city, county and State traffic engineering departments.

The FTA will also appoint an individual in each Regional Office who will be responsible for grade crossing safety issues. Future intermodal efforts on grade crossing safety will be carried out in coordination with FRA Regional Grade Crossing Managers and FHWA's Regional Safety Engineers.

NHTSA

NHTSA will work with the State directors of public transportation, through relevant national organizations, to develop a system to improve bus routing safety by focusing on highway-rail crossings. The Agency will also develop an in-service training program for school bus drivers, addressing highway-rail crossing safety.

NHTSA will lend its support to FHWA in the expansion of the highway-rail crossing safety section of the Model Commercial Driver License Manual, and will seek the support of the AAMVA in increasing attention to rail crossing safety in driver testing for commercial driver licenses.

TASK FORCE UPDATES

The Task Force will reconvene one year after issuance of this report to evaluate progress in implementation of its recommendations. Reducing highway-rail crossing accidents and fatalities is a long-term commitment-one which the Department and the Task Force consider to be of the highest priority.

ON GUARD

Prepared by U.S. Department of Transportation
Office of Motor Carriers Federal Highway Administration

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Washington, D.C.

**DRIVER ! KEEP TRACK
OF THOSE TRAINS !**

It was 6:58 p.m. in a small southern town. Most of the town residents were relaxing after what they thought was another ordinary work day. Suddenly, the town was rocked by a tremendous explosion. A train had struck a tractor-trailer loaded with gasoline, spewing gasoline which caught fire and exploded. Fire spread to a nearby building, killing six people and injuring five others. Nineteen cars were destroyed by the fire. The train engine derailed and was also damaged by fire. Total property damage was estimated at \$425,000.

Investigators determined that the probable cause of this accident was the failure of the truck driver to obey the crossing warning devices. He had attempted to drive across the railroad tracks ahead of the train. Was this really an accident? Hardly. It was a preventable tragedy! Statistics indicate that there was a loss of nearly 1,000 lives in 1978 and 900 in 1979 at rail-highway crossings. Most investigations reveal that if an added degree of driver caution had been present, the accident would have been avoided. Compliance with the Federal Motor Carrier Safety Regulations and just good common sense dictate that you slow down to assure the way is clear

at rail-highway crossings--if you're transporting certain hazardous materials you are required to stop completely! Report to your supervisor crossings without flashing warning signals, signals not operating properly, and crossings and signals which are visually obstructed. Your supervisor may then notify other drivers and proper state authorities of the hazard and have it corrected. One sure way to prevent a rail-highway crossing accident is to try to plan your route where there are underpasses or overpasses at each point the highway crosses a railroad track.

TAKE THE SAFE BET--RECOGNIZE THE CROSSING WARNING SIGNALS AS A DANGER AND APPROACH THEM AS IF A TRAIN WERE ALWAYS PRESENT.

You'll Live to Drive Another Day !

ON GUARD

Prepared by U.S. Department of Transportation
Office of Motor Carriers Federal Highway Administration
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Washington, D.C.
BETTER SAFE THAN SORRY !

At 1:10 a.m. on August 25, 1933, in Rowland, North Carolina, a northbound train struck a tractor lowboy semitrailer that had become lodged on the high profile grade crossing of a single main track. Two locomotives and two passenger cars derailed. The combination was damaged substantially and its cargo destroyed. Two of 365 train passengers were treated at the scene, 15 were taken to the hospital, one passenger was admitted, and the others treated and released. The truck driver was not injured. Property damage was estimated at \$623,000.

Investigation disclosed several factors which may have contributed to the accident. The motor carrier was in violation of the Federal Motor Carrier Safety Regulations by not maintaining a driver qualification file or medical certification file for the driver to ensure that his background, driving experience, and physical condition qualified him to drive in interstate commerce. The motor carrier was also found to be operating in interstate commerce without authority as well as operating an overweight vehicle. The design of the railroad grade crossing also contributed to the accident because it did not provide adequate ground clearance for vehicles towing lowboy type semitrailers.

While the FMCSR do not prescribe standards for highway design, they do require commercial motor carriers and their drivers to operate their vehicles safely on our Nation's highways. Had the motor carrier been in compliance with the FMCSR this accident may not have occurred. It is better to be safe than sorry.

ON GUARD

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Office of Motor Carriers Federal Highway Administration

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Washington, D.C.

TRUCKS AND TRACKS: AVOID THE HEADLINES !

You may have seen newspaper headlines like these:

TRUCK-AMTRAK CRASH KILLS 14

4 DIE IN FIERY TRAIN-TRUCK WRECK

TRAIN RAMS SEMI STALLED ON TRACK;

DRIVER, ENGINEER BOTH KILLED

Were these "accidents"? Far from it ! They were tragedies that could easily have been prevented. How ?

By compliance with the Federal Motor Carrier Safety Regulations and just plain common sense. The regulations require that trucks hauling hazardous materials must stop completely at all railroad crossings.

Common sense comes in by dictating that a driver should be driving slowly enough when approaching railroad crossings to be able to stop if necessary.

And common sense should tell you that trucks with low ground clearances can get hung up on high-profile grade crossings. In other words, plan your route to avoid that possibility. The few minutes these precautions will cost you are worth the time you'll gain to make another delivery another day.

(Educational materials to improve truck driver performance at highway-rail grade crossings may be obtained from Operation Lifesaver, 800-537-6224.)

ON GUARD

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Office of Motor Carriers Federal Highway Administration

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Washington, D.C.

THEY'RE STILL STALLING !

In March of 1994, we warned you to be "On Guard" for hazardous situations where truck-tractor and trailer rigs could become stalled on railroad tracks. We cautioned you to approach the tracks slowly enough to stop if necessary. We pointed out that trucks hauling hazardous materials have to make full and complete stops at all highway-rail crossings. We urged drivers whose trucks have low ground clearances not to take chances at high-profile grade crossings.

But, some drivers are still stalling, grounding out, or high centering at highway-rail crossings. Not only that, they're still being hit by trains. Since we issued that 1994 "On Guard" bulletin, more than 100 truck-trailer rigs have been struck by trains while stopped or stalled at crossings and more than 30 people have been injured as a result.

What actions should you take if your truck "high centers" at a highway-rail intersection ?
First, notify the State or local police immediately, utilizing 911, if available, to:

1. Advise them of the situation, and of the location.
2. Ask them to notify the railroad immediately.
3. Ask them to assist on site as quickly as possible.

The driver should look around the crossing for posted emergency phone numbers for the railroad and call it directly, if possible. Warning signs or flares should be placed on the road to alert others available to assist you. You should also consider using flares along the railroad right-of-way approximately a mile in each direction to warn approaching trains.

But the flares are no guarantee that trains will stop. The engineer may not see the flare or be able to stop in time.

Everyone should stay clear of the stranded vehicle. If there is a radio or phone in the vehicle, the driver should use it and then stay clear. If a train approaches, everyone should move as far away as possible from the track. This should best protect you from any impact.

RAILWAY/HIGHWAY GRADE CROSSING TIPS FOR PROFESSIONAL DRIVERS

The following tips are reprinted with permission from the pamphlet
Working Together For Safety, published by Operation Lifesaver, Inc., Alexandria VA.

GENERAL PRECAUTIONS

1. Expect a train at any time on any track ! Be certain you can stop safely if a train is approaching.
2. Do not rely on the train whistle to warn you ! In-cab noise may mask the train's warning.
3. Do not attempt to cross the tracks unless you are certain the vehicle you are driving will clear on the other side. Never shift gears while crossing railroad tracks.
4. Be cautious for obstructions which may block the view of an approaching train--vegetation, buildings, standing railcars, etc.
5. Be alert to weather and how it affects conditions at the crossings, such as impaired vision and difficulty in stopping.
6. When possible, plan your trip to use grade separations where available crossings equipped with flashing light warning devices or flashing lights and gates.
7. Look up and down the tracks. It is difficult to judge the distance and approach speed of a train as it moves toward the crossing. If in doubt, be safe, stop, and wait.
8. Slow down and be prepared to stop at the first railroad warning sign.

LOOK, LISTEN, AND LIVE !

NOTE:

Refer to the Federal Motor Carrier Safety Regulations, Subpart B--Driving of Vehicles, Sections 392.10 and 392.11 for complete U.S. DOT Regulations on Railroad Grade Crossings.

Appendix

Blue Ribbon Working Group Participants

U.S. DOT HIGHWAY-RAIL CROSSING SAFETY TASK FORCE STUDY

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